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## The Trechinae (Coleoptera, Carabidae) from Northern Vietnam II. Tropical Genera of the Tribe Trechini<sup>1)</sup>

By

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**Abstract** Two trechine genera so far known only from tropical areas of northern Vietnam are dealt with. One of them is *Trechiotes* JEANNEL with two known species, *T. perroti* (JEANNEL) and *T. luticola* sp. nov., both fully winged; the other is a new genus, *Paratrechiotes*, with one apterous species, *P. ocydromoides* sp. nov. All the taxa are either described or redescribed, their affinities are discussed, and condition of their existence is explained.

The ground beetles of the subtribe Trechina are mainly distributed in the Northern Temperate Zone and on high mountains in the tropics, and are extremely rare in the lowlands of tropical regions. One of those rare exceptions is *Trechiotes perroti* (JEANNEL) (1954, p. 13) described from Kep in the Hanoi Plain of northern Vietnam.

Described on a single female, this trechine beetle always puzzled carabid taxonomists. It is not unlike certain oculate species of *Trechiama*, but more closely resembles certain bembidiines in its facies. It is unique in elytral chaetotaxy, which represents a type not found in any other groups of the Trechinae. Besides, its type locality is situated in a tropical plain, where no carabid collectors would look for trechine beetles.

I first examined the unique type of this strange species at the Muséum National d'Histoire Naturelle, Paris, in 1973, and again in 1977. I was confident then that it is an isolated species that should be classified in its own genus, though it was originally placed in a new subgenus of the grand genus *Trechus*. My opinion was accepted by CASALE and LANEYRIE (1982, pp. 2, 24, 157), who placed the genus *Trechiotes* in the phyletic series of *Trechus*.

When our entomological expedition to northern Vietnam was finally realized in the autumn of 1994, I naturally exerted myself to collect additional specimens, especially males, of this problematical species. We visited its type locality twice to search for the beetle, but our efforts were not repaid for the reason to be explained

1) This study is supported by the Grant-in-aid No. 06041116 for Field Research of the Monbusho International Scientific Research Program, Japan.

later (cf. also UÉNO, 1995, p. 14). Since the species is fully winged and evidently capable of flight, however, I did not abandon the hope of coming across the trechine somewhere other than the type locality, and near the end of the second expedition made in the spring of 1995, finally succeeded in obtaining a pair of a *Trechiotes* in the twilight zone of a small limestone cave about 140 km to the south-southwest of the type locality of *T. perroti*. Although these specimens were later proved specifically different from JEANNEL's, they were doubtless congeneric with the latter. It was revealed from a careful study of these fresh materials that *Trechiotes* is much stranger than was considered by JEANNEL in the chaetotaxy of its elytra. We also succeeded in discovering a probable derivative of the same lineage in a tropical forest on an isolated mountain lying between the two known localities of true *Trechiotes*.

In the second part of this series of papers, I will take up these tropical species of Vietnamese trechines. A renewed account of the genus *Trechiotes* will be given, its genitalic features will be introduced into science for the first time, its type species will be redescribed in full detail on the basis of the type specimen, and a second species of the genus will be described. Following these accounts, a new genus, *Paratrechiotes*, will be introduced into science, together with its type species, *P. ocydromoides*, which is apterous and mesophilous. The abbreviations used herein are the same as those explained in previous papers of mine.

Before going further, I wish to express my heartfelt thanks to the members of the second expedition to northern Vietnam, above all to Dr. Yoshiaki NISHIKAWA and Dr. Akiko SAITO, whose help in the field brought about these brilliant discoveries. I am also deeply indebted to Dr. Thierry DEUVE of the Muséum National d'Histoire Naturelle, Paris, without whose kind collaboration I could never have confirmed the presence of a chaetotaxial feature of vital taxonomic importance in the type specimen of *T. perroti*, which escaped the eyes of all the previous researchers.

#### Genus *Trechiotes* JEANNEL, 1954

*Trechiotes* JEANNEL, 1954, Revue fr. Ent., 21, p. 14 (as a subgenus of *Trechus*); type species: *Trechus perroti* JEANNEL, 1954.

*Trechiotes*: S. UÉNO, 1982, Ent. gen., Stuttgart, 8, p. 76 (as a genus). — CASALE & LANEYRIE, 1982, Mém. Biospéol., Moulis, 9, pp. 24, 157.

Probably belonging to the *Trechiama* series but different from all the known genera of the genus-group in the unique chaetotaxy of elytra.

Body elongate, *Peryphus*-like, dark-coloured, with long elytra; surface completely glabrous on both dorsum and venter; appendages excluding buccal ones long. Microsculpture sharply impressed on head, mostly consisting of fine transverse meshes; those on pronotum and elytra formed by fine irregularly

transverse lines though largely obliterated. Inner wings fully developed.

Head small, wider than long, with large protruding eyes and short genae, the latter of which are glabrous, contracted behind, and form a deep neck constriction at the sides; frontal furrows deep throughout and regularly arcuate; supraorbital pores lying on lines more or less divergent behind, two pores on each side being close to each other and the posterior one not adjoining frontal furrow; labrum transverse, more or less distinctly emarginate at apex; mandibles stout though sharply hooked at apices, right mandible provided with an anteriorly extending retinaculum and a sharp premolar tooth; mentum free, not fused with submentum, the former bearing a large tooth in apical emargination, which is either obtusely bifid (*T. perroti*) or widely truncated at the apex and slightly incised at the middle of the truncature (*T. luticola*), the latter sexsetose; ligula produced at middle, with usual setation, paraglossae rather short though extending beyond ligula; labial palpus slender though not long, with penultimate segment slightly dilated towards apex and quadrisetose, apical segment elongated subfusiform, about as long as penultimate segment and asetose; maxillae rather short, of usual conformation, maxillary palpus slender, asetose, apical segment similar to that of the labial but slightly longer than penultimate segment; antennae long and slender, filiform, with terminal segment not particularly large.

Pronotum small, cordate, with the base very briefly pedunculate; sides entirely bordered, distinctly sinuate before hind angles, which are rectangular, with two pair of marginal setae, the posterior one of which is almost on hind angles; median line distinct, reaching base though hardly widening in basal area; apical transverse impression vague, with indistinct longitudinal wrinkles; basal transverse impression mal-defined though marked with a distinct foveole on each side of median line; basal foveae deep, smooth and divergent anteriad; post-angular carinae fairly long; basal area narrow, notched along basal border. Scutellum distinct though small.

Elytra long, moderately depressed, with distinct shoulders and rather wide marginal borders; prehumeral borders perpendicular to the mid-line and reaching the incurved base of stria 5; striae almost entire, distinctly punctate, four or five inner ones deeply impressed, others shallow or fragmentary, stria 8 deeply impressed behind the middle set of marginal umbilicate pores and smooth, no striae forming complete anastomoses at apices; scutellar striole long, impunctate; apical striole deep, fairly long, only feebly curved, and free at the anterior end though directed to stria 5; intervals more or less convex on the disc, apical carina obvious; internal series composed of three setiferous dorsal pores, the proximal one on stria 2 and the posterior two on stria 3; external series composed of a single setiferous dorsal pore lying on stria 5 at about the same level as the one on stria 2; preapical pore adjoining the weak subapical convexity of stria 2 within the field of apical striole; marginal umbilicate pores completely aggregated.

Ventral surface smooth; anal sternite bisetose in ♂, quadrisetose in ♀, the inner pair of setae in ♀ rarely supplemented by an additional seta on one side. Legs fairly slender; protibiae straight and gradually dilated towards apices, each with a deep longitudinal groove on the external face and completely glabrous on the anterior face; tarsi slender, tarsomere 1 slightly shorter than 2–4 together in mesotarsus, distinctly shorter than that in metatarsus, tarsomere 4 with a long ventral apophysis in pro- and mesotarsi; in ♂, protarsomeres 1 and 2 rather widely dilated and stoutly produced inwards at apices.

Male genitalia very small; aedeagus arcuate, low-walled in apical two-thirds, and mostly membranous on dorsum, with straight basal part and gradually tapered apical lobe, the latter of which is also straight and simple; inner sac inerm. Styles large, with short and broad apical parts, each bearing four apical setae.

*Range.* Known so far only from near the foots of low hills in northern Vietnam.

*Notes.* Because of the unique elytral chaetotaxy, *Trechiotes* should be regarded as an independent genus. It is tentatively placed in the *Trechiama* group in view of the presence of a setiferous dorsal pore on the fifth elytral stria, but may have a closer affinity to the *Trechus* group, as is suggested by the occurrence of *Paratrechiotes* to be described on later pages. The pore on the fifth stria was overlooked by JEANNEL and also by subsequent specialists including myself who reexamined the type specimen of *Trechus perroti*. Having realized its presence on a second species of the seemingly same genus, I borrowed the type of *T. perroti* from Paris through the courtesy of Dr. Th. DEUVE, and carefully examined it in comparison with the newly obtained beetle. This proved beyond doubt that *T. perroti* also possesses the pore on the fifth stria, although the seta has been lost from both the elytra of the unique type. It mingles in a row of coarse striae punctures and is difficult to be found out unless specially looked for.

*Trechiotes* is also unique in its facies. It is not unlike certain oculate *Trechiama* in its elongate body form, but resembles more closely certain bembidiines of the genus *Ocydromus*. Besides, it consists of tropical species quite unusual for the ground beetles of the subtribe Trechina. Further details of their habitats will be explained in the Notes following the descriptions of the species.

In a previous paper of mine (UÉNO, 1981, p. 60, foot-note), I suggested that *Trechiotes* might have some relationship to *Eocnides* JEANNEL (1954, p. 10). It is, however, apparent at present that these genera are radically different from each other, and that all the superficial similarities between them seem to have resulted from their primitive status and their adaptation to hygrophilous mode of life. I have already demonstrated that *Eocnides* "represents an archaic type of the Trechina and has relationship to both the *Trechoblemus* group and the *Trechus* group" (cf. UÉNO, 1989, pp. 12–14). *Trechiotes* may represent another archaic type of the subtribe, which has given rise to both the *Trechiama* group and the

*Trechus* group.

***Trechiotes perroti* (JEANNEL, 1954)**

(Fig. 1)

*Trechus (Trechiotes) Perroti* JEANNEL, 1954, Revue fr. Ent., 21, p. 13; type locality: Kep [in] Tonkin.

*Trechiotes perroti*: CASALE & LANEYRIE, 1982, Mém. Biospéol., Moulis, 9, p. 157, fig. 97.

Length: 5.05 mm (from apical margin of clypeus to apices of elytra).

A medium-sized trechine beetle of elongate body form, with large eyes and fully developed hind wings. Colour blackish brown, with brownish clypeus, vertex and pronotal basal area, elytra dark brown with brown margins, ventral surface wholly dark brown including epipleura, shiny, faintly iridescent on pronotum and elytra; buccal appendages brown except for pale palpi; antennae and legs yellowish brown to light reddish brown.

Head small, about three-fourths as long as wide, depressed above, with deep frontal furrows rather widely divergent in front and behind; frons and supraorbital areas gently convex, the latter foveolate at the roots of anterior supraorbital setae; eyes large, convex, genae only a little more than one-fifth as long as eyes; neck wide; labrum rather deeply emarginate at apex and widely rounded on each side; antennae slender, extending slightly beyond the middle of elytra, segment 2 the shortest, about three-fourths as long as scape or segment 3, segments 4–7 subequal in length to one another, each subcylindrical and about 4.5 times as long as wide, segments 8–9 slightly shorter than 7 though slightly longer than 10, terminal segment the longest, about 1.3 times as long as scape though narrower than the latter.

Pronotum small, cordiform, wider than head, wider than long, widest at five-eighths from base, and a little more gradually contracted towards base than towards apex; PW/HW 1.30, PW/PL 1.24, PW/PA 1.53, PW/PB 1.45; sides widely bordered throughout, moderately and widely rounded in front, briefly but deeply sinuate at about basal seventh, and then briefly divergent towards hind angles, which are rectangular though produced laterad; apex very slightly arcuate, slightly narrower than base, PB/PA 1.05, with front angles blunt and almost rounded off; base slightly arcuate at middle, shallowly and obliquely emarginate on each side just inside hind angle; dorsum gently convex though depressed on the disc.

Elytra elongated ovate, evidently wider than and about three times as long as prothorax, widest at about middle, feebly narrowed towards bases, but attenuate towards narrow apices; EW/PW 1.58, EL/PL 3.08, EL/EW 1.57; shoulders distinct though rounded, prehumeral borders slightly arcuate and almost perpendicular to the mid-line at the innermost portions; sides rather widely reflexed

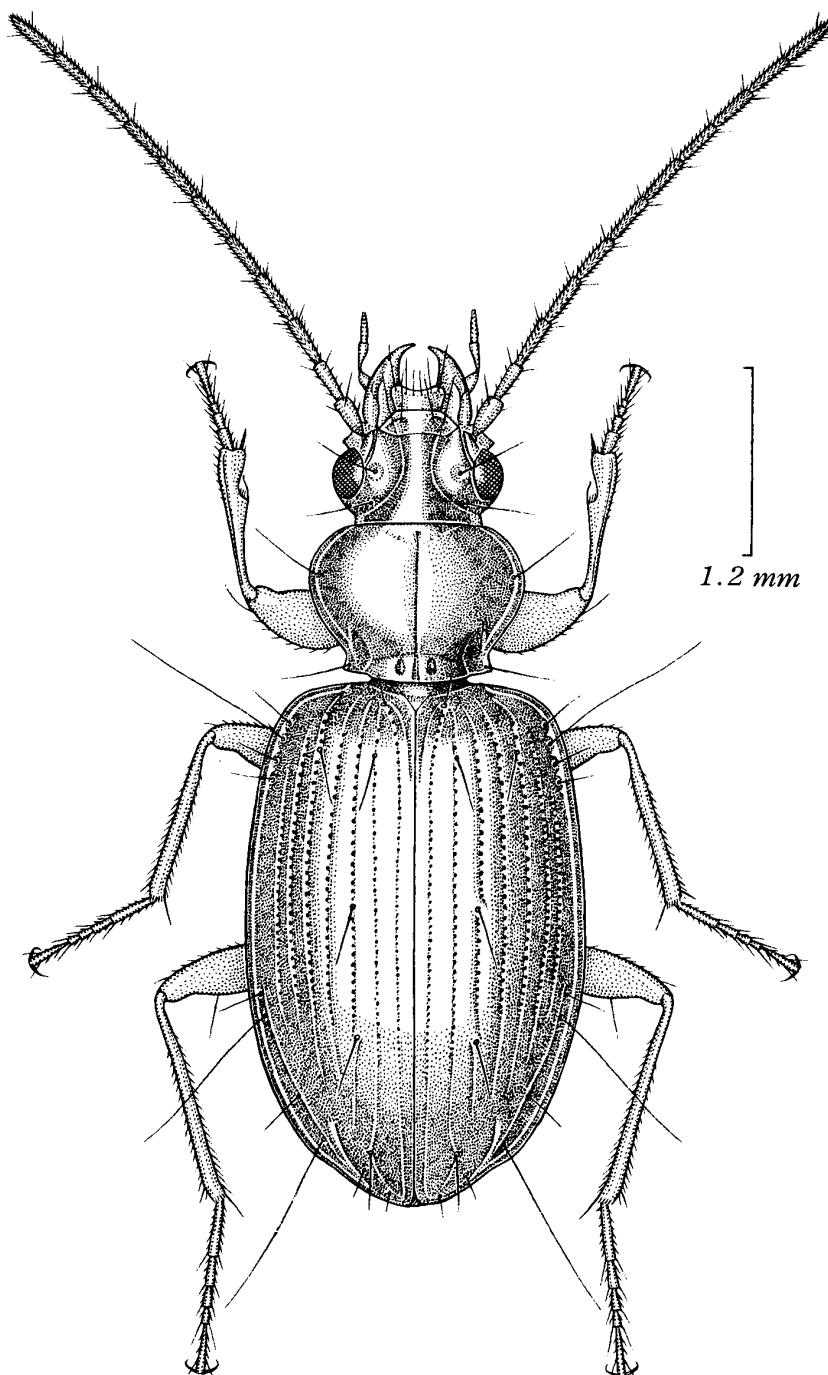


Fig. 1. *Trechiotes perroti* (JEANNEL), ♀ holotype, from Kep. The seta of the external dorsal series is restored.

throughout, almost straightly divergent from behind shoulders, feebly arcuate at middle, more feebly so in apical third, and then very narrowly and separately rounded at apices, forming a small re-entrant angle at suture; disc widely depressed, with gentle apical declivity; striae deeply impressed on the disc and

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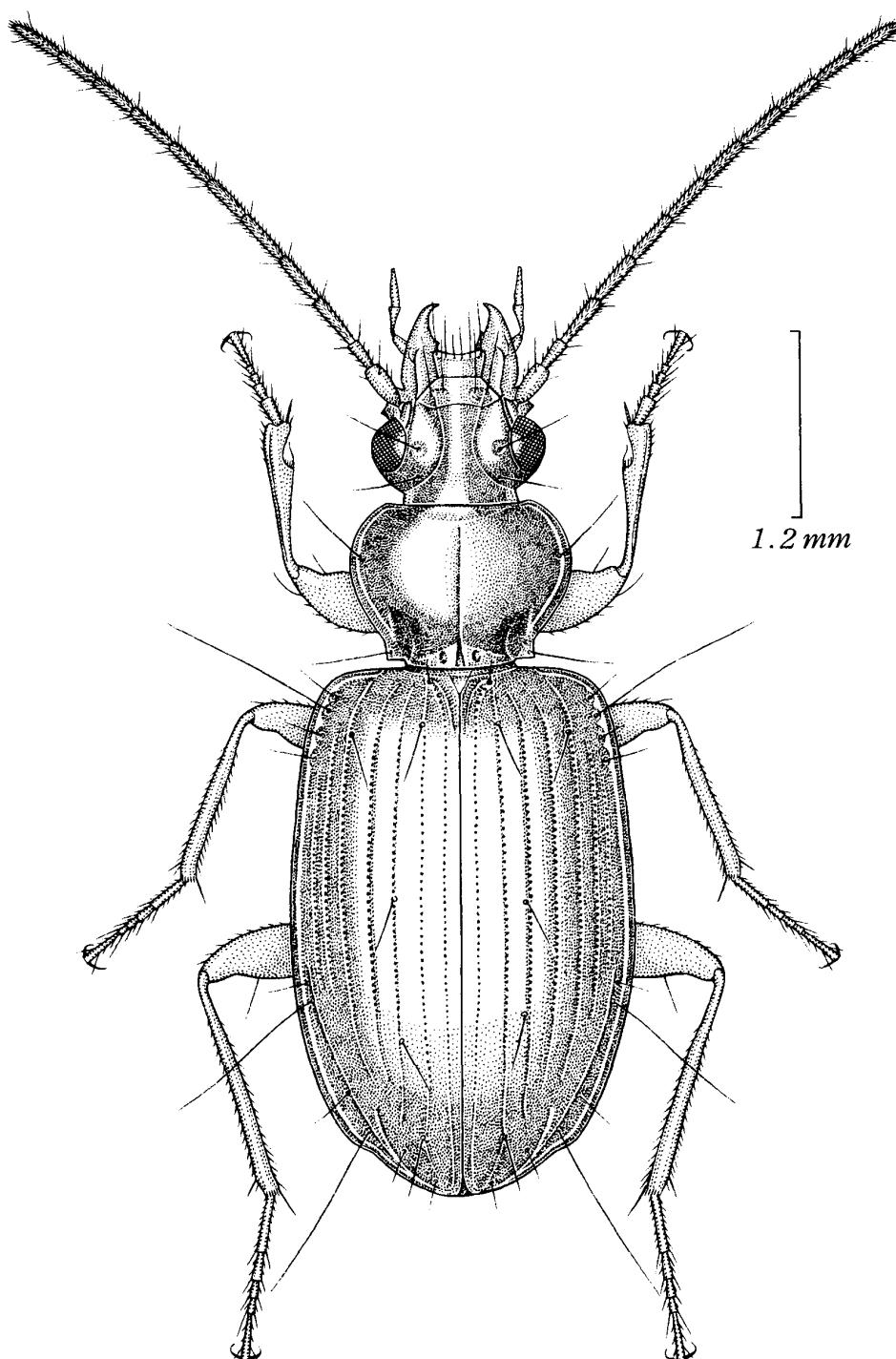


Fig. 2. *Trechiotes luticola* S. UENO, sp. nov., ♀, from Dong Dong Bai Cave at Cuc Phuong.

distinctly punctate, especially in basal two-thirds, stria 5 shallower than inner ones though obviously deepened at the basal portion, 6 obsolete near base, 7 fragmentary though indicated by a row of punctures, 8 evanescent proximally; intervals

gently convex on the disc; stria 2 with a setiferous dorsal pore at about 1/9 from base, stria 3 with two setiferous dorsal pores at about 2/5 and 2/3 from base, respectively, stria 5 with a single dorsal pore at about the same level as the one on stria 2; preapical pore lying behind the level of the terminus of apical striole, almost equally distant from suture and from apical striole, and much more widely distant from apex than from suture.

Legs fairly slender; tarsi thin.

Male unknown.

*Specimen examined.* 1 ♀ (holotype), bearing five labels: Kep Tonkin / Ex coll. H. Perrot / HOLOTYPE / *T. (Trechiotes) Perroti* n. sp. [in JEANNEL's handwriting] / *Trechiotes perroti* — MNHN, Paris.

*Type locality.* Kep in Ha Bac Province, northern Vietnam.

*Notes.* This is the only trechine species previously described from northern Vietnam that I have been unable to reobtain. I visited the type locality twice and searched for the beetle, but the Kep area, which is said to have been forested in the prewar time, is now converted into an extensive cultivated land. *Trechiotes perroti* may still survive somewhere at the edges of watercourses, but to find out its habitats may not be easy because of drastic change of environmental condition in the past fifty years or so.

In any case, Kep is a small town lying near the northeastern corner of the Hanoi Plain, about 63 km distant from the capital. Its altitude is only about 50 m above sea-level, and the hills at the back of the area are also low, mostly lower than 400 m in height. These hills are calcareous and completely deforested, so that surface streams are rare. The climate is naturally tropical, and the air temperature often rises to above 40°C in the summertime.

#### *Trechiotes luticola* S. UÉNO, sp. nov.

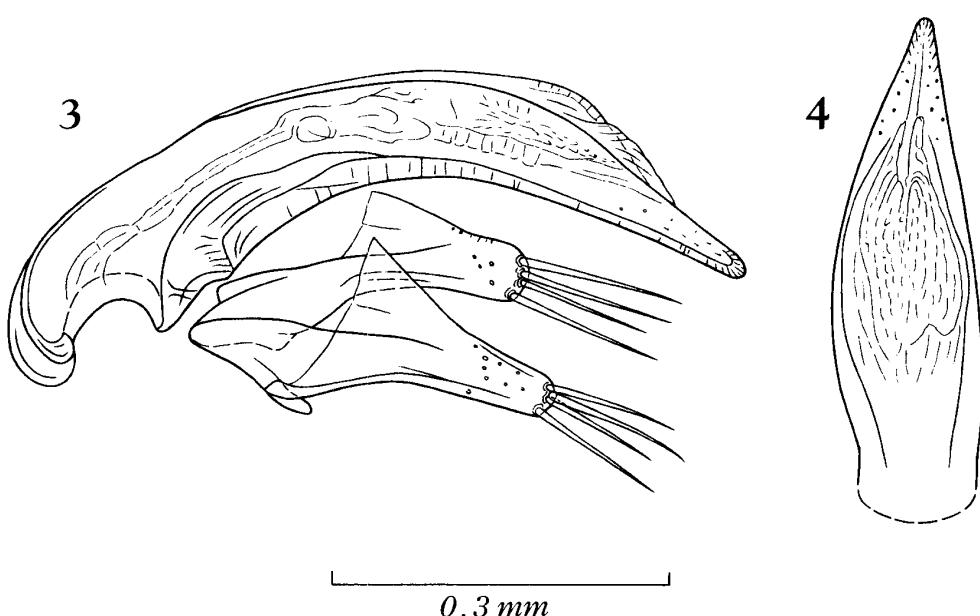
(Figs. 2-4)

Length: 5.25-5.30 mm (from apical margin of clypeus to apices of elytra).

Closely allied to *T. perroti*, only differing from it in the shape of prothorax and elytra.

Colour in the allotype almost identical with that of *T. perroti*, though the elytra are infuscated in apical areas and the ventral surface is mostly reddish. In the holotype, colour black, with reddish brown neck and reddish basal areas of elytra; ventral surface of hind body reddish brown except for dark epipleura.

Head as in *T. perroti*, but the genae are slightly longer (about three-tenths as long as eyes) and more strongly contracted behind, and the labrum is more widely and less deeply emarginate at apex and less widely rounded on each side; antennae slightly shorter, reaching the middle of elytra in ♂, somewhat shorter than that in ♀. Pronotum a little narrower at apex than in *T. perroti*, with sides more



Figs. 3-4. Male genitalia of *Trechiotes lutticola* S. UÉNO, sp. nov., from Dong Dong Bai Cave at Cuc Phuong; left lateral view (3), and apical part of aedeagus, dorso-apical view (4).

strongly rounded in front, less deeply sinuate behind, and almost parallel before hind angles, which are rectangular and hardly produced laterad; PW/HW 1.29, PW/PL 1.25, PW/PA 1.65 in the holotype, 1.58 in the allotype, PW/PB 1.44 in the holotype, 1.48 in the allotype, PB/PA 1.15 in the holotype, 1.07 in the allotype. Elytra broader in both basal and apical areas, so that the sides are more parallel, especially in basal three-fifths; shoulders squarer, with prehumeral borders less oblique; sides moderately arcuate behind middle and more widely rounded at apices; striae as in *T. perroti* in the holotype ♂, shallower and more finely punctate in the allotype ♀, stria 7 more clearly traceable in both ♂ and ♀; intervals less convex in ♀ than in ♂ even on the disc; chaetotaxy as in *T. perroti*, though position of the dorsal pores is variable to some extent; EW/PW 1.59 in the holotype, 1.58 in the allotype, EL/PL 3.10 in the holotype, 3.08 in the allotype, EL/EW 1.56. Legs as in *T. perroti*, though somewhat stouter in ♂.

Male genital organ very small though moderately sclerotized. Aedeagus only about one-fifth as long as elytra, fairly elongate, depressed, moderately arcuate, lightly compressed behind basal bulb, and widely membranous on dorsum; basal part not bent ventrad, with small basal orifice whose sides are almost semi-circularly emarginate; sagittal aileron fairly large though narrow; apical part gradually tapered into apical lobe, which is narrow and blunt at the extremity in dorsal view, straightly produced and narrowly rounded at the extremity in lateral view; ventral margin widely emarginate to the base of apical lobe in profile. Inner sac inerm, though somewhat scaly near apical orifice. Styles large and broad, with

short apical parts; left style obviously longer than the right, each bearing four setae at apex.

*Type series.* Holotype: ♂, allotype: ♀, 27-V-1995, S. UÉNO leg. Deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

*Type locality.* Limestone cave called Dong Dong Bai, 170 m in altitude, at Cuc Phuong of Gia Vien in Ninh Binh Province, northern Vietnam.

*Notes.* This and the preceding species are closely related to each other, and are regarded as vicariants isolated by the Hong Ha River and its delta, or the Hanoi Plain. Actually, the known localities of the two species are situated at the two ends of the plain, though other localities of the beetles should exist along the northern and the southern borders of the delta.

Since males are unknown of *T. perroti*, the allotype female of *T. luticola* is illustrated herewith for facilitating comparison between the two species. The male of the latter species is a little less depressed, especially on the elytra, which are more deeply striated on the disc as in *T. perroti*.

The two specimens of the type series of *T. luticola* were collected in the twilight zone of a small limestone cave lying near the lowest part of the Cuc Phuong National Park. A narrow stream emerges from the side of a shallow depression covered with tropical trees, cuts a deep groove for a short distance through a thick deposit of red clay, and sinks into a narrow cave opening at the bottom of a vertical limestone cliff, which is called Dong Dong Bai. It has deposited mud banks in the twilight zone of the cave, on which were found many epigean, or rather scotophilous, ground beetles, including a *Paratachys*, a *Tachyura* and an *Abacetus*. *Trechiotes* was found from crevices between the mud bank and the cave wall, and was very active when exposed. This suggests that the trechine beetle is primarily ripicolous and highly hygrophilous, inhabiting muddy banks of narrow streams in tropical forests. Incidentally, the air temperature at the entrance to the cave was 39°C in the afternoon of the day when SAITO and I visited it. Unfortunately, we were unable to explore the deeper part of the cave, since the stream falls into a narrow pit thickly coated with slippery mud just beyond the twilight zone.

#### Genus *Paratrechiotes* S. UÉNO, nov.

Type species: *Paratrechiotes ocydromoides* S. UÉNO, sp. nov.

Probably derived from a *Trechiotes*-like ancestor, but similar in many respects to the members of the *Trechus* group. Readily recognized from all the other trechines on the unusually coarse punctures of elytral striae.

Body short and broad, *Peryphus*-like in facies, dark-coloured and polished; surface completely glabrous on both dorsum and venter. Microsculpture mostly

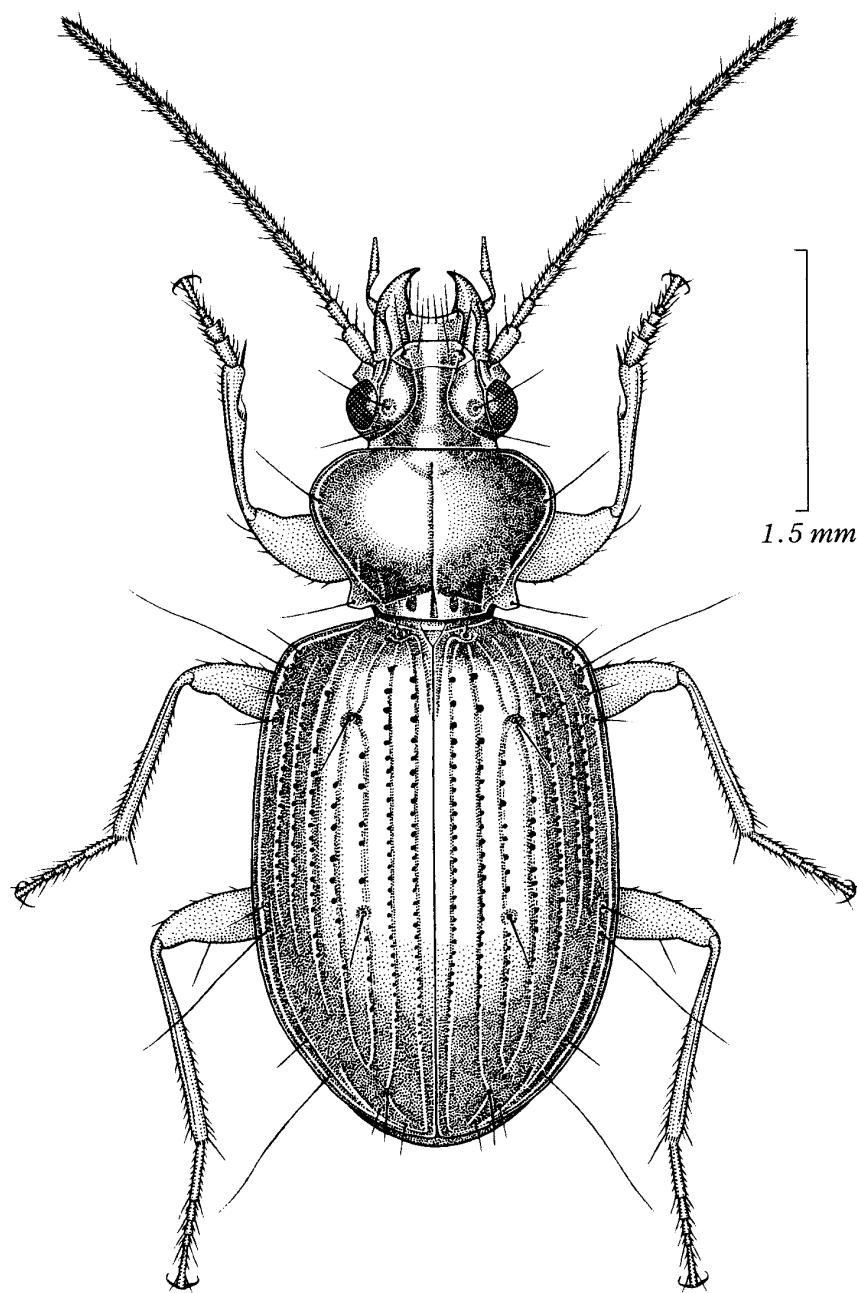


Fig. 5. *Paratrechotes ocydromoides* S. UÉNO, gen. et sp. nov., ♂, from Mt. Tan Vien.

consisting of irregularly transverse lines, though degenerated even on head except on vertex, which is rather clearly reticulated; pronotum and elytra mostly devoid of microsculpture. Inner wings absent.

Head small, transverse, with large eyes and entire frontal furrows, the latter of which are not angulate at middle, divergent gently anteriad and widely posteriad; supraorbital areas provided with two pair of supraorbital setae on lines distinctly divergent behind, the roots of the anterior pair obviously foveolate;

genae short, completely glabrous, contracted behind towards neck constriction which is sharply marked at the sides; labrum transverse, distinctly emarginate at the apex; mandibles short and stout though sharply hooked at apices, right mandible with an obtuse premolar tooth, which is not so prominent as in *Trechiotes*; mentum not fused with submentum, the former bearing a broad tooth in apical emargination, which is deeply cleft at the tip, the latter sexsetose; ligula wide, truncated at the apex, with usual setation; maxillae fairly stout though of usual conformation; palpi short but rather thin, penultimate segments moderately dilated towards apices, about as long as apical segment and quadrisetose in labial palpus, obviously shorter than the apical and asetose in maxillary palpus, apical segments elongated subconical; antennae rather short, filiform, and not dilated towards apices.

Pronotum transverse cordate, with briefly pedunculate base; sides entirely bordered, strongly arcuate in front, briefly but deeply sinuate behind, and then more or less divergent towards hind angles, which are almost rectangular and briefly lobed postero-laterad, with two pair of marginal setae, the posterior one of which is almost on hind angles; front angles very obtuse, almost rounded off; median line distinctly impressed, widened and deepened in basal area, and reaching basal border; apical transverse impression shallow and more or less uneven, with longitudinal wrinkles; basal transverse impression shallow and mal-defined, with a distinct foveole on each side of median line; basal foveae large, deep and smooth, diverging anteriad; postangular carinae not prominent; basal area narrow and smooth. Scutellum small and transverse.

Elytra ovate, convex, with distinct shoulders and slightly oblique prehumeral borders, the latter reaching the incurved base of interval 5; striae very coarsely punctate, deeply impressed on the disc but nearly obsolete at the side, striae 3 and 4 usually forming apical anastomosis, stria 8 indistinct before the middle set of marginal umbilicate pores though indicated by a row of coarse punctures, deeply impressed and impunctate in apical half; scutellar striole deeply impressed, impunctate; apical striole short but deep, nearly straight for the most part, and free at the anterior end, though seemingly directed to stria 6 or 7; intervals convex on the disc, flat at the side, apical carina narrow and distinct; stria 3 with two setiferous dorsal pores, the proximal one of which usually lies on an anastomosis of striae 3 and 4, no dorsal pore of the external series; preapical pore lying in the field of apical striole, adjoining the subapical convexity of stria 2, and evidently closer to apical striole than to suture; apical pores close to each other; marginal umbilicate pores aggregated, though the four pores of the humeral set are somewhat inequidistant.

Ventral surface smooth; anal sternite bisetose in ♂, quadrisetose in ♀. Legs not particularly long; protibiae straight, gently dilated towards apices, deeply grooved on the external face, and completely glabrous on the anterior face; tarsi

thin, tarsomere 1 shorter than the following three tarsomeres together in mesotarsus, about as long as that in metatarsus, tarsomere 4 with a long ventral apophysis in pro- and mesotarsi; in ♂, protarsomeres 1 and 2 widely dilated and sharply produced inwards at apices.

Male genitalia fairly large and robust; aedeagus short, widely open on dorsum to near the proximal end though the basal tip itself is completely closed, with large basal part and spatulate apical lobe, the latter of which is deflexed near apex, widely rounded at the extremity, and longitudinally carinate on the ventral side; no sagittal aileron; inner sac armed with two copulatory pieces closely lying one above the other, both protruding from apical orifice and inclined to the right, the dorsal one being remarkably reflexed at the apex; styles narrow, ventral apophysis of left style much reduced, each style bearing four apical setae.

*Range.* Known so far only from an isolated mountain lying near the western end of the Hanoi Plain, northern Vietnam.

*Notes.* The type species of this new genus could be regarded as an aberrant offshoot of *Trechus*, were it not for the knowledge of *Trechiotes*. It bears almost all the characteristics of *Trechus*, but is radically different from the latter in the unusually coarse strial punctures of the elytra. In describing *Trechiotes*, JEANNEL (1954, p. 14) pointed out that "la très forte ponctuation des stries n'a d'équivalent chez aucune espèce connue." This feature is much more pronounced in *Paratrechiotes*, which gives the beetle an *Ocydromus*-like appearance. It also looks like certain trechodines, mainly because of the briefly pedunculate prothoracic base, but the aedeagal basal part is completely closed, which is the character state diagnostic of the tribe Trechini.

*Paratrechiotes* differs from *Trechiotes* in many features currently considered important for trechine taxonomy. It lacks dorsal setae on both the second and the fifth striae, so that its elytral chaetotaxy is identical with that of *Trechus* except for the position of the preapical pore, which does not settle on the apical anastomosis of the second and the third striae. Its aedeagus bears remarkably developed copulatory sclerites instead of being inerm; the briefly pedunculate prothoracic base and the polished integument are also peculiar. Besides, the short broad body form of *Paratrechiotes* is markedly different from the elongate parallel-sided one of *Trechiotes*, though this is no doubt correlated with the loss of hind wings and the mesophilous mode of life. All these differences may be regarded as evidences to show that the two genera belong to two different lineages, but if so, we have to recognize two new phyletic groups of their own for *Trechiotes* and *Paratrechiotes*, respectively, since either of them cannot be satisfactorily placed in one of the phyletic series hitherto defined.

In my present opinion, *Paratrechiotes* had better be regarded as a derivative of a *Trechiotes*-like ancestor, even though there are considerable differences between them, above all in elytral chaetotaxy. The former has become adapted to

mesophilous life, has lost flying ability, and has undergone morphological modification which includes reduction of dorsal setae on the elytra. On the other hand, *Trechiotes* survives in its original habitats, that is, muddy water-edges in tropical plains, and remains unmodified to the present. The flying ability is indispensable for those hygrophilous ground beetles, since tropical plains are regularly flooded in rainy seasons and the floods immerse everything in deep water.

It should be noted that our knowledge is still very insufficient about the trechine fauna of Southeast Asia including southern China, which is surmised to have been a centre of radiation of the subtribe Trechina. Many more primitive forms may still remain undiscovered in the region. Classification of primitive lineages of the subtribe has to be revised when a sufficient number of those species are brought to light in the future.

*Paratrechiotes ocydromoides* S. UÉNO, sp. nov.

(Figs. 5–7)

Length: 4.15–4.80 mm (from apical margin of clypeus to apices of elytra).

An apterous trechine beetle of broad body form with fairly slender appendages. Colour black, polished, with iridescent lustre on elytra; clypeus, buccal appendages and antennae reddish brown, venter of hind body dark reddish brown; legs, especially femora, yellowish brown, tibiae and tarsi usually light reddish brown.

Head small, about five-sevenths as long as wide, depressed above, with frontal furrows deeply impressed in apical three-fourths; frons and supraorbital areas moderately convex; eyes large and convex, their contour continuing to genae, which are 1/7–2/7 as long as eyes and rather strongly contracted behind; neck wide; labrum moderately emarginate at the apex; mandibles broad at the basal parts, sharply incurved at the apices; antennae not very long though slender, reaching basal third to two-fifths of elytra, segment 2 the shortest, about four-fifths as long as scape or each of segments 3–6, segments 7–10 very gradually decreasing in length towards terminal segment, which is the longest though obviously narrower than scape, middle segments subcylindrical, each three times or more as long as wide.

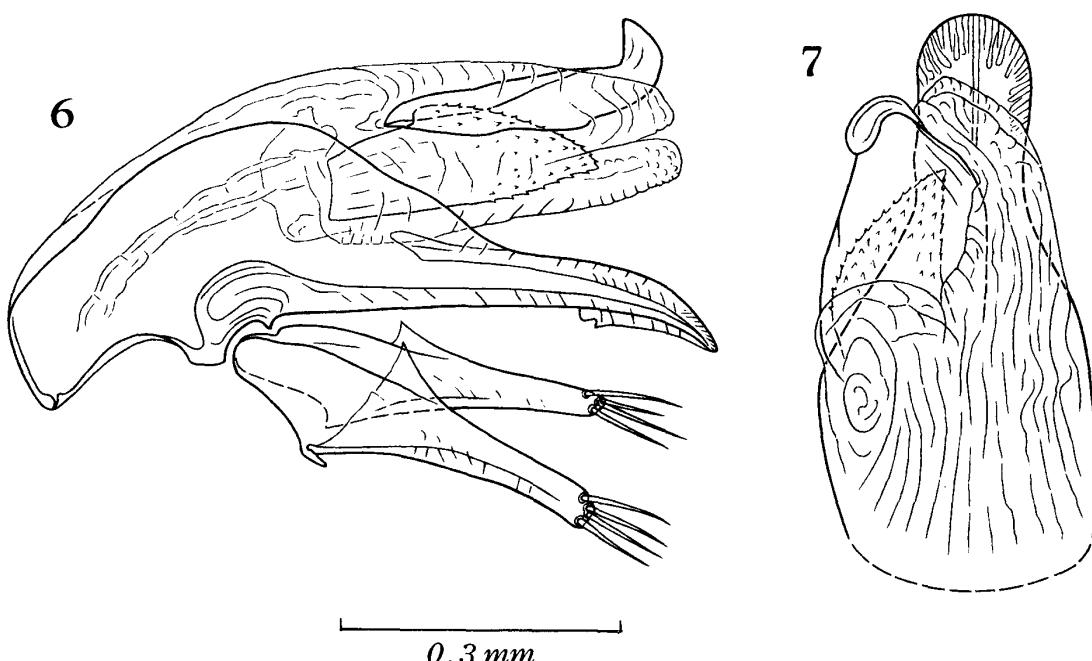
Pronotum fairly large, transverse cordate, much wider than head, widest at a level three-fifths to two-thirds (usually at about five-eighths) from base, and more strongly contracted towards apex than towards base; PW/HW 1.34–1.44 (M 1.41), PW/PL 1.28–1.41 (M 1.34), PW/PA 1.65–1.88 (M 1.72), PW/PB 1.36–1.48 (M 1.42); sides narrowly bordered, sometimes rather widely so near the widest part, strongly rounded before middle, less so near front angles and behind middle, deeply sinuate at a level between basal sixth and fifth, and then divergent towards hind angles; apex either straight or slightly arcuate, narrower than base,

PB/PA 1.15–1.29 (M 1.21), with inconspicuous front angles; base subtruncated, slightly arcuate, briefly but deeply emarginate on each side inside hind angle, which is subrectangular though blunt or narrowly rounded at the tip; dorsum strongly convex and smooth.

Elytra ovate, with broad basal parts, obviously wider than prothorax, widest at about middle or slightly behind that level, and much more gradually narrowed towards bases than towards apices; EW/PW 1.47–1.59 (M 1.52), EL/PL 2.66–3.06 (M 2.91), EL/EW 1.36–1.50 (M 1.44); shoulders distinct though rounded, prehumeral borders a little oblique and hardly arcuate; sides rather widely reflexed at the humeral parts, more narrowly so in apical three-fourths, nearly straight behind shoulders, gently arcuate behind middle, and widely and almost conjointly rounded at apices; surface strongly convex though somewhat depressed on the disc before middle, with steep apical declivity; striae very deeply impressed on the disc, becoming shallower at the side, very coarsely punctate especially in basal two-thirds, the punctures becoming finer in apical part of each stria, striae 1–4 entire, 5 deeply impressed at the base but obsolete in apical part, 6 and 7 abbreviated at the two ends though clearly indicated by rows of coarse punctures, 8 also indicated by a row of coarse punctures in proximal half; intervals obviously convex on the disc; stria 3 with two setiferous dorsal pores at about 1/6 and 1/2–5/9 from base, respectively; preapical pore almost equally distant from apex and from suture and much closer to apical striole than to suture.

Legs as described under the genus.

Male genital organ fairly large and rather heavily sclerotized. Aedeagus short, a little more than one-fourth as long as elytra, not arcuate, obviously wider than high, and widely open on dorsum, with the dorsal margins of lateral walls semicircularly rounded in profile; basal part large and broad, round in dorsal view, and not bent ventrad, with fairly large basal orifice whose sides are deeply emarginate; apical lobe long, spatulate, clearly distinguished from the main part of aedeagus, subparallel-sided and very widely rounded at the apex in dorsal view, gradually attenuate and deflexed before pointed apex in lateral view, with a longitudinal carina on the ventral side in apical three-fifths; ventral margin nearly straight in profile. Inner sac large, mostly separated from aedeagus, produced apico-dorsally, and armed with two large copulatory pieces protruding right apically; dorso-apical sclerite about two-fifths as long as aedeagus, almost horizontal, smooth on the surfaces, embracing the dorsal edge of ventro-proximal sclerite at the right ventral side, and abruptly narrowed in apical part, which is rectangularly curved dorsad and forms a lingulate process inclined to the right; ventro-proximal sclerite slightly shorter than the dorso-apical one and lying obliquely from right dorsal to left ventral, subparallel-sided in proximal half, lanceolate apically, and pointed at the apex, with the margins and surfaces scattered with short spinules at the apical part. Styles slender, left style only a



Figs. 6–7. Male genitalia of *Paratrechiotus ocydromoides* S. UÉNO, gen. et sp. nov., from Mt. Tan Vien; left lateral view (6), and apical part of aedeagus, dorso-apical view (7).

little longer than the right, each bearing four short setae at the apex.

**Type series.** Holotype: ♂, allotype: ♀, 28-IV-1995, S. UÉNO leg. Paratypes: 10 ♂♂, 16 ♀♀ (incl. 3 teneral ♂♂), 28-IV-1995, S. UÉNO & Y. NISHIKAWA leg. All deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

**Type locality.** Mt. Tan Vien, 820m in altitude, in Ba Vi of Ha Tay Province, northern Vietnam.

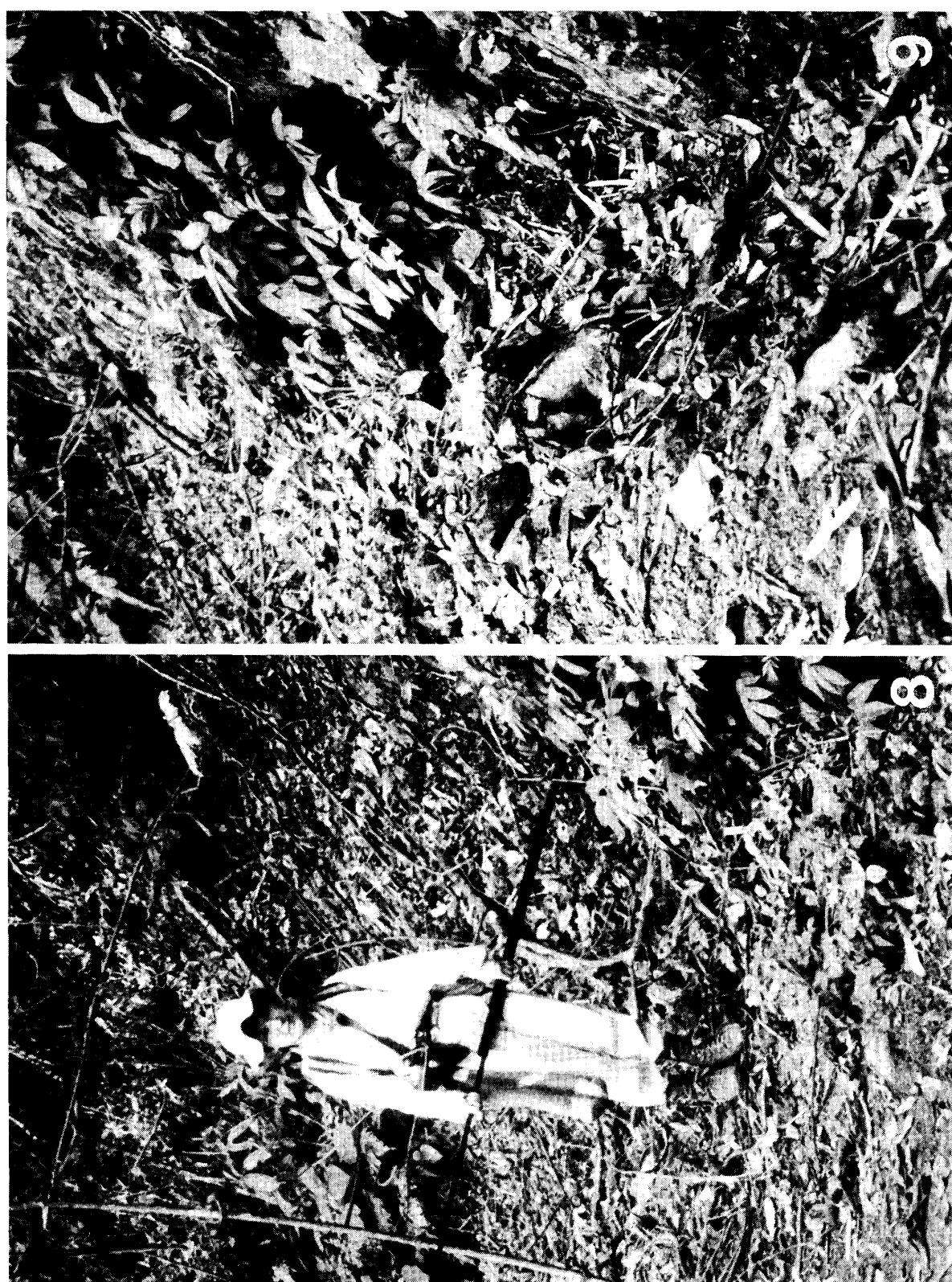
**Notes.** This interesting species is mesophilous, living in a thick tropical forest on Mt. Tan Vien, which is an isolated mountain lying near the western end of the Hanoi Plain, on the right side of the Hong Ha River opposite to Mt. Tam Dao. It is about 55 km distant to the southwest from Mt. Tam Dao (the type locality of *Trechus vietnamicus* and *Vietotrechus minutissimus*), about 94 km to the north-northwest from Cuc Phuong (the type locality of *Trechiotes luticola*), and about 104 km to the west-southwest from Kep (the type locality of *Trechiotes perroti*).

Isolated as it is, Mt. Tan Vien maintains rather a peculiar fauna. Though

Figs. 8–9. — 8. Habitat of *Paratrechiotus ocydromoides* S. UÉNO, gen. et sp. nov., on the northern slope of Mt. Tan Vien. The entomologist standing at the centre is Dr. Akiko SAITO. — 9. Close-up of the right lower continuation of the same place, showing a shallow groove along the rock wall fed by a seepage.

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Figs. 8-9.

there is a temperate vegetation near the summit (1,296 m in height), I failed to find any *Trechus* in arrow-bamboo groves, which are comparable to those of Mt. Tam Dao. Instead, I unexpectedly came across a colony of *Paratrechotes* by the roadside halfway up the northern slope of the mountain. All the specimens collected were found within a small shaded place fed by seepages, from beneath rock debris covered with humid dead leaves. They looked like bembidiines at first sight, but their way of quick running was typically that of trechines. We searched for other habitats of the beetle all along the climbing route, and were only exhausted with fruitless hard labour.

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